

## REMARKS

Claims 1-8 and 10-37 are pending in the application.

Claims 1-8 and 10-37 have been rejected.

Claim 1 has been amended.

No new matter has been added.

Reconsideration of the Claims is respectfully requested.

### 1. Rejection under Section 103

In general, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

Although the Supreme Court, in re-confirming the Graham factors, had admonished the use of the teaching-suggestion-motivation (TSM) test as an end of the obviousness inquiry, “[the Court] also recognized that [the teaching-suggestion-motivation (TSM) rationale] was one of a number of valid rationales that could be used to determine obviousness.” MPEP § 2143 at 2100-118 (Rev. 6, Sept. 2007). Under this rationale, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Also, a finding is to be articulated that there was a reasonable expectation of success. MPEP § 2143 (G) at page 2100-138 (Rev. 6, Sept. 2007).

Further, all claim limitations must be considered. That is, “[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.” MPEP § 2143.03 at page 2100-142 (Rev. 6, Sept. 2007) (citations omitted).

(a) Claims 1-4, 8, 10, 13-15, 18-22, 25-28, 31-34, and 37 were rejected under 35 U.S.C. 103(a) as being unpatentable over WO 03/032593 to Sundaralingam (“Sundaralingam”) in view of U.S. Published Application No. 2004/0156448 to Sahlin et al. (“Sahlin”).

(b) Claims 5-7, 11, 12, 16, 17, 23, 24, 29, 30, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sundaralingam in view of Sahlin, and in further view of U.S. Patent No. 6,400,928, to Khullar et al. (“Khullar”).

Sundaralingam relates to GMSK and 8psk demodulation paths, in which such demodulation techniques have “not [been] able to deal particularly well [with] adjacent and/or co-channel interference.” (Sundaralingam at page 3, *ll. 21-22*). Sundaralingam recites a “method for determining a modulation method applied to a received signal . . . comprising demodulating said received signal suing at least two different modulation methods, determining for each demodulated signal an estimate of said channel . . . and based on [a *n* tap variance] comparison making a determination as to the modulation method applied to the received signal.” (Sundaralingam at page 5, *ll. 15-23*). Sundaralingam does not recite distinguishing over a RF burst order (or index), nor does Sundaralingam take into consideration subsequent RF burst characteristics with respect to its modulation method applied to a received signal.

Sahlin relates to “a blind detection solution . . . by a method of identifying, from a finite set of alternatives (hypotheses), a property of an incoming signal . . . , which is characterized by deriving quality measures in consideration of interference rejection with respect to unwanted signal components in the incoming signal . . . .” (Sahlin ¶ 0007-08).

Sahlin recites that the “quality measure . . . may represent a respective signal-to-noise ratio (SNR) after whitening, [in which] the test [is based] upon the largest quality measure value (i.e. best SNR).” (Sahlin ¶ 0045).

In the perspective of a base station, Sahlin recites “different training [sequence types that] are employed by the transmitter without prior indication to the receiver.” (Sahlin ¶ 0047). Sahlin in particular recites that a “base station receiving an uplink signal from the mobile station . . . cannot know in advance with of the three possible training [sequence types] that will be sent. Therefore, the receiver in the base station must perform a blind detection . . . . The quality measures to be compared [are for each] training sequence TS0, TS1 and TS2 respectively.” (Sahlin ¶ 0047).

Sahlin recites a “recursive unit 200 may be utilized to improve the quality of selection decisions in GSM/EDGE between the modulation schemes GMSK and 8PSK. In GSM/EDGE a radio block typically consists of four individual bursts. . . .” Sahlin, however, further recites that

it is “common that a further signal treatment (equalisation, decoding etc) of a *first received burst of a block must commence* before the later bursts have been received.” (Sahlin ¶ 0075). That is, Sahlin does not recite burst index considerations with respect to modulation determination. Also, Sahlin does not recite comparing a training sequence to a first reconstructed training sequence to produce error magnitude results, nor to produce a channel energy based upon a processed training sequence.

Khullar relates to “blind detection of modulation in a wireless telecommunication network [in which a] first modulation scheme is selected according to a current channel quality [and] the plurality of bursts are modulated using the selected first modulation scheme.” (Khullar 2:24-32). Khullar recites that “[a]fter each of the plurality of bursts is received, modulation detection statistics are calculated for each burst.” (Khullar 2:33-35).

In contrast to the cited references, Applicant’s amended Independent Claim 1 recites, *inter alia*, a “method to identify a modulation format of a data frame received from a servicing base station by a wireless terminal in a cellular wireless communication system, the method comprises: receiving a first Radio Frequency (RF) burst of the data frame from the servicing base station, wherein the first RF burst carries a plurality of modulated symbols and a *burst index*; when the *burst index* of the first RF burst comes within a predetermined index value, extracting a training sequence from the first RF burst, wherein the training sequence comprises modulated symbols; . . . receiving a subsequent RF burst within the data frame from the servicing base station, wherein the subsequent RF burst carries a plurality of modulated symbols and a *subsequent burst index*; when the *subsequent burst index* comes within the predetermined index value, . . . ; and identifying the modulation format of the data frame as corresponding to the greater accumulated channel energy.” (emphasis added).

Applicant’s Independent Claim 8 recites, *inter alia*, a “method to identify a modulation format of a data frame transmitted between a servicing base station and a wireless terminal in a cellular wireless communication system, the method comprises: receiving a first Radio Frequency (RF) burst of the data frame from the servicing base station, wherein the first RF burst carries a plurality of modulated symbols; *extracting a training sequence from the first RF burst*, wherein the training sequence comprises modulated symbols; *producing a first channel estimate based on the training sequence assuming a first modulation format*; . . . *producing a second channel estimate based on the training sequence assuming a second modulation format*; . . . *processing*

the training sequence assuming the first modulation format *to produce a subsequent first error magnitude*; accumulating the subsequent first error magnitude with the first error magnitude to *produce an accumulated first error magnitude*; *processing the training sequence assuming the second modulation format to produce a subsequent second error magnitude*; accumulating the subsequent second error magnitude with the second channel energy to *produce an accumulated second error magnitude*; determining *a smaller accumulated error magnitude* from the first accumulated error magnitude and the second accumulated error magnitude; and identifying the modulation format of the data frame as the one corresponding to the smaller error magnitude.” (emphasis added).

Applicant’s Independent Claim 13 recites, *inter alia*, a “wireless terminal that comprises: a Radio Frequency (RF) front end; a baseband processor communicatively coupled to the RF front end; an enCODer/DECoder (CODEC) processing module communicatively coupled to the baseband processor; wherein, the RF front end, the baseband processor, and the CODEC processing module are operable to: receive a first Radio Frequency (RF) burst of a data frame from the servicing base station, wherein the first RF burst carries a plurality of symbols modulated according to a modulation format; extract a training sequence from the first RF burst, wherein the training sequence comprises modulated symbols; process the training sequence assuming a first modulation format to produce a first channel energy; process the training sequence assuming a second modulation format to produce a second channel energy; . . . determine a greater accumulated channel energy from the first accumulated channel energy and the second accumulated channel energy; and identify the modulation format of the data frame as a modulation format corresponding to the greater accumulated channel energy.” (emphasis added).

Applicant’s Independent Claim 19 recites, *inter alia*, a “wireless terminal that comprises: a Radio Frequency (RF) front end; a baseband processor communicatively coupled to the RF front end; wherein, the RF front end and the baseband processor are operable to: receive a first Radio Frequency (RF) burst of a data frame from the servicing base station, wherein the first RF burst carries a plurality of symbols modulated according to a modulation format; extract a training sequence from the first RF burst, wherein the training sequence comprises symbols modulated according to the unknown modulation format; process the training sequence assuming a first modulation format to produce a first channel energy; process the training sequence assuming a second modulation format to produce a second channel energy; receive a subsequent RF burst within the data frame from the servicing base station, wherein the subsequent RF burst carries a

plurality of modulated symbols; *process the training sequence assuming the first modulation format to produce a subsequent first channel energy; . . . process the training sequence assuming the second modulation format to produce a subsequent second channel energy; accumulate the subsequent second channel energy with the second channel energy to produce an accumulated second channel energy; determine a greater accumulated channel energy from the first accumulated channel energy and the second accumulated channel energy; identify the modulation format of the data frame as a modulation format corresponding to the greater accumulated channel energy.*” (emphasis added)

Applicant’s Independent Claim 26 recites, *inter alia*, a wireless terminal that comprises: a Radio Frequency (RF) front end; a baseband processor communicatively coupled to the RF front end; an enCODer/DECoder (CODEC) processing module communicatively coupled to the baseband processor; wherein, the RF front end, the baseband processor, and the CODEC processing module are operable to: receive a first Radio Frequency (RF) burst of a data frame from the servicing base station, wherein the first RF burst carries a plurality of symbols modulated according to an unknown modulation format; *extract a training sequence from the first RF burst, wherein the training sequence comprises modulated symbols; produce a first channel estimate based on the training sequence assuming a first modulation format; apply the first channel estimate to a reference training sequence of the first modulation format to produce a first reconstructed training sequence; produce a second channel estimate based on the training sequence assuming a second modulation format; apply the second channel estimate to a reference training sequence of the second modulation format to produce a second reconstructed training sequence; compare the training sequence to the first reconstructed training sequence to produce a first error result; compare the training sequence to the second reconstructed training sequence to produce a second error result; receive a subsequent RF burst within the data frame from the servicing base station, wherein the subsequent RF burst carries a plurality of modulated symbols; extract a subsequent training sequence from the subsequent RF burst; apply the first channel estimate to the reference training sequence of the first modulation format to produce a subsequent first reconstructed training sequence; apply the second channel estimate to the reference training sequence of the second modulation format to produce a subsequent second reconstructed training sequence; compare the subsequent training sequence to the subsequent first reconstructed training sequence to produce a subsequent first error result; compare the subsequent training sequence to the subsequent second reconstructed training sequence to produce a second error result; accumulate the first error result with the subsequent first error result to produce an*

*accumulated first error result; accumulate the second error result with the subsequent second error result to produce an accumulated second error result; identify the modulation format as a modulation format of the data frame corresponding to a lesser accumulated error result.”* (emphasis added).

Applicant's Independent claim 32 recites, *inter alia*, a “wireless terminal that comprises: a Radio Frequency (RF) front end; a baseband processor communicatively coupled to the RF front end; wherein, the RF front end and the baseband processor are operable to: . . . extract a training sequence from the first RF burst, wherein the training sequence comprises symbols modulated according to the unknown modulation format; produce a first channel estimate based on the training sequence assuming a first modulation format; apply the first channel estimate to a reference training sequence of the first modulation format to produce a first reconstructed training sequence; produce a second channel estimate based on the training sequence assuming a second modulation format; apply the second channel estimate to a reference training sequence of the second modulation format to produce a second reconstructed training sequence; compare the training sequence to the first reconstructed training sequence to produce a first error result; compare the training sequence to the second reconstructed training sequence to produce a second error result; . . . extract a subsequent training sequence from the subsequent RF burst; apply the first channel estimate to the reference training sequence of the first modulation format to produce a subsequent first reconstructed training sequence; apply the second channel estimate to the reference training sequence of the second modulation format to produce a subsequent second reconstructed training sequence; . . . accumulate the first error result with the subsequent first error result to produce an accumulated first error result; accumulate the second error result with the subsequent second error result to produce an accumulated second error result; identify the modulation format of the data frame as a modulation format corresponding to the reconstructed training sequence having a lesser error result.” (emphasis added).

Accordingly, Applicant respectfully submits that a *prima facie* case of obviousness has not been established. There is no suggestion or motivation for the hypothetical combination of Sundaralingam with Sahlin to achieve Applicant's claimed invention as set forth in its Independent Claims and those claims that depend directly or indirectly therefrom. Further, Applicant respectfully submits that the cited references do not teach or suggest all the claim limitations, as indicated in the italicized portions of its claims set forth above. Further, Applicant

respectfully submits that the addition of Khullar does not provide the necessary suggestion or motivation, or the limitations, lacking in the cited references of Sundaralingam and/or Sahlin.

**2. Conclusion**

As a result of the foregoing, the Applicant respectfully submits that Claims 1-8 and 10-37 have been rejected, in the Application are in condition for allowance, and respectfully requests allowance of such Claims.

If any issues arise, the Applicant respectfully invites the Examiner to contact the undersigned at the telephone number indicated below or at [ksmith@texaspatents.com](mailto:ksmith@texaspatents.com).

The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Garlick Harrison & Markison Deposit Account No. 50-2126.

Respectfully submitted,

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